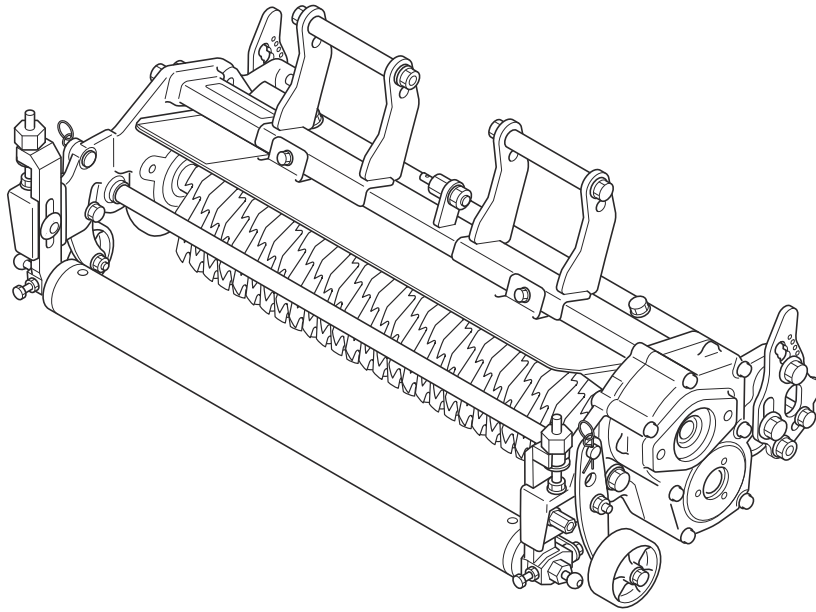


ATR311

Thatching Reel Unit

Owner's Operating Manual



Serial No. ATR311 : 10001-

"Required reading"
Read this manual before using the machine.

BARONESS[®]
Quality on Demand

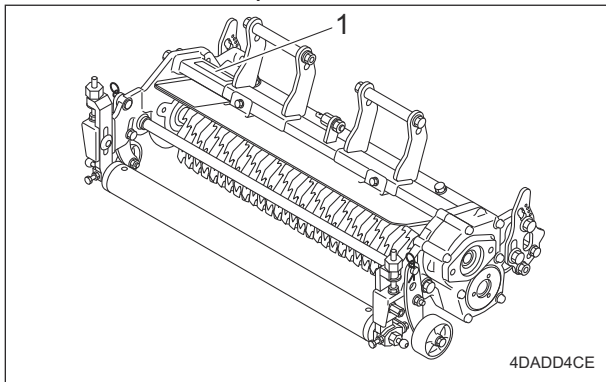
Ver.1.0

Greeting

Thank you for purchasing the Baroness product. This manual describes the proper handling, adjustment, and inspection of your product. We hope you will use the product safely, and take advantage of its best performance. For details on the handling, adjustment and inspection of the main vehicle, refer to the Owner's Operating Manual for the main vehicle.

QR Code

A QR code for this thatching reel unit is printed on the serial number plate.



QR Code_001

1	QR code
---	---------

Scan the QR code with your smartphone for easy access to Baroness Manual Reference Service where you can browse Owner's Operating Manual and Parts Catalog.
<https://doc.baroness-international.com/manuals/ATR311>



QR Code_002

Read this manual carefully to ensure that you thoroughly understand how to properly operate and maintain the product, and to avoid causing injury to yourself or others.

The operator is responsible for operating the product properly and safely.

Maintenance service for this machine should be performed by a mechanic with expertise.

If you have any questions concerning maintenance or genuine parts, please contact a Baroness dealer or Kyoisha.



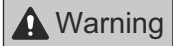
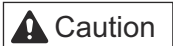

When making inquiries about your product, please specify the model and serial number.

When loaning or transferring the product, please also provide this manual together with the product.

Kyoisha Co., Ltd.


Warning Symbols

This manual uses the following warning symbols for handling precautions that are important for your safety.

 <p style="text-align: center;">696cq5-001</p>	<p>Warning symbol</p>
<p>This symbol indicates the articles regarding “Danger,” “Warning,” or “Caution.” Those articles describe important safety precautions and so read them carefully to understand completely before operating the machine. Failure to adequately follow these safety precautions may cause an accident.</p>	
<p> Danger</p> <p>This symbol indicates that serious injury or death will occur if the warning is ignored.</p> <p> Warning</p> <p>This symbol indicates that serious injury or death may occur if the warning is ignored.</p> <p> Caution</p> <p>This symbol indicates that injury or damage to property may occur if the warning is ignored.</p> <p> Important</p> <p>This symbol indicates precautions on the mechanism of the machine.</p>	

Introduction

Precautionary Statement

 Caution

The information described in this manual is subject to change for improvement without prior notice.

When replacing parts, be sure to use genuine Baroness parts or parts designated by Kyoisha.

Note that the Baroness product warranty may not apply to defects caused by the use of parts from other companies.

Prior to use, carefully read the following manuals to thoroughly understand the contents for safe and correct operation.

- Baroness Owner's Operating Manual

Purpose

This thatching reel unit is intended for dethatching in golf courses.

Do not use this machine in any way other than its intended purpose, and do not modify the machine.

Operating this thatching reel unit for other purposes and modifying it may be very dangerous and may cause damage to the machine.

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ATR311

Contents

Safe Operating Practices Page 1-2

Safety

Failure to adequately follow these safety precautions may cause an accident resulting in injury or death.

⚠ Danger

This product is designed to ensure safe operation and has been tested and inspected thoroughly before shipment from the factory. The product is equipped with safety devices to prevent accidents.

However, whether the product demonstrates its original performance level depends on the manner in which it is operated and handled, as well as the manner in which it is managed on a daily basis.

Inappropriate use or management of the product may result in injury or death.

Observe the following safety instructions to ensure safe operation.

Safe Operating Practices

Read Safe Operating Practices described in the Owner's Operating Manual of Baroness main vehicle equipped with this thatching reel unit thoroughly.

Recycle and Waste Disposal Page 2-2

About RecyclePage 2-2

About Waste Disposal Page 2-2



Disposal

Recycle and Waste Disposal

About Recycle

Recycling battery etc. is recommended for environmental conservation and economical use of resources.

It may be required by local laws.

About Waste Disposal

Make sure that waste generated when servicing or repairing the machine is disposed of in accordance with local regulations. (e.g. waste oil, antifreeze, rubber products, and wires etc.)

Specifications Page 3-2

SpecificationsPage 3-2

Features of Thatching Reel Unit Page 3-2

Names of Each Section Page 3-3

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Positions of Regulation Decals Page 3-3

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About Safety Decals and Instruction
DecalsPage 3-4

Positions of Safety Decals and
Instruction Decals Page 3-4

Description of Safety Decals and
Instruction Decals Page 3-4

Product Overview

Specifications

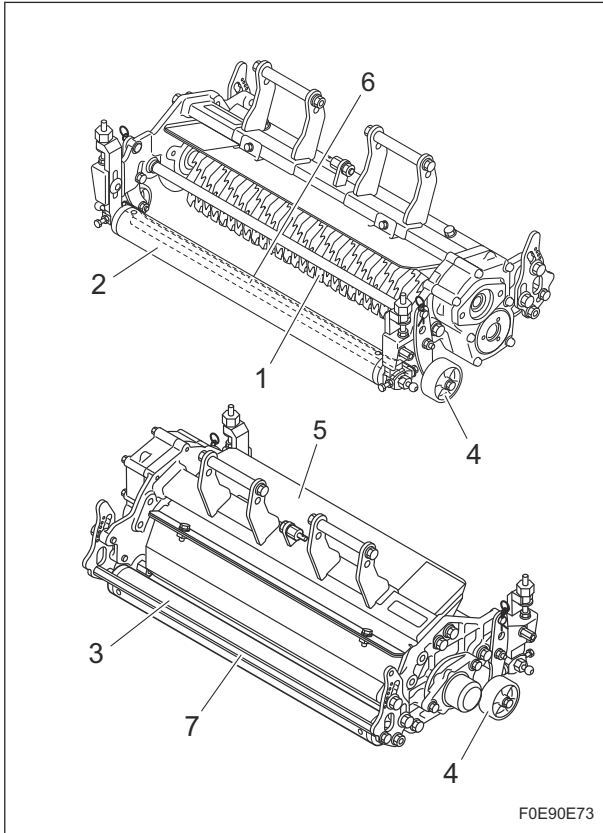
Specifications

Model		ATR311		←	←	←	←	←	←
Name		Thatching Reel Unit		←	←	←	←	←	←
Type		for Green		←	←	for Tee and Field		←	←
Dimensions	Total length	352 mm	13.86 in	←	←	←	←	←	←
	Total width	732 mm	28.82 in	←	←	←	←	←	←
	Total height	287 mm	11.30 in	←	←	←	←	←	←
Weight		36.0 kg	79.37 lb	37.5 kg	82.67 lb	35.5 kg	78.26 lb	34.3 kg	75.62 lb
Operating width		484 mm	19.10 in	478 mm	18.82 in	484 mm	19.10 in	488 mm	19.21 in
Operating depth		0 - 2.0 mm	0 - 0.079 in	←	←	0 - 3.0 mm	0 - 0.12 in	←	←
Thatching Blade	Type	Without tips		With tips		Without tips		With tips	
	Number per unit	36		35		19		←	
	Diameter	138 mm	5.43 in	←	←	←	←	←	←
	Thickness	0.8 mm	0.031 in	1.2 mm	0.047 in	0.8 mm	0.031 in	1.2 mm	0.047 in
	Space between blades	13 mm	0.51 in	←	←	26 mm	1.02 in	←	←

Features of Thatching Reel Unit

Spirally installed thatching blades can remove thatch from the lawn.

Names of Each Section

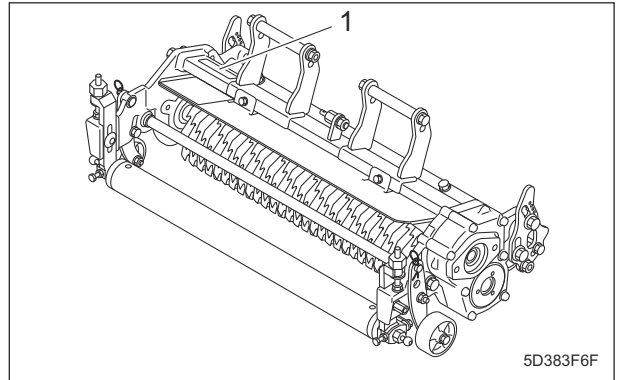


Names of Each Section_001

1	Thatching reel
2	Front roller
3	Rear roller
4	Traveling roller
5	Cutter cover
6	Front scraper
7	Rear scraper

Regulation Decals

Positions of Regulation Decals



Positions of Regulation Decals_001

1	Serial number plate
---	---------------------

Description of Regulation Decals

Serial Number Plate

The serial number plate indicates the model and serial number of the machine. A QR code is also printed for browsing Owner's Operating Manual and Parts Catalog.



Serial Number Plate_001

Product Overview

Safety Signs and Instruction Signs

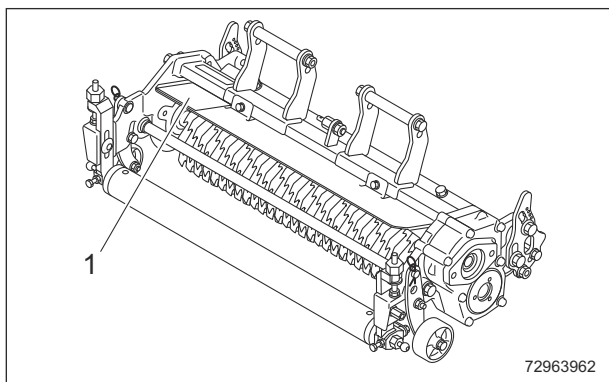
About Safety Decals and Instruction Decals

Important

Safety decals and instruction decals are attached to this mower unit. Make sure that decals are preserved in their entirety. If they are damaged, become dirty, or peel off, replace them with new ones.

Part numbers for decals that need to be replaced are listed in the parts catalog. Order them from a Baroness dealer or Kyoeshia.

Positions of Safety Decals and Instruction Decals



Positions of Safety Decals and Instruction Decals_001

1	Caution to mutilation decal
---	-----------------------------

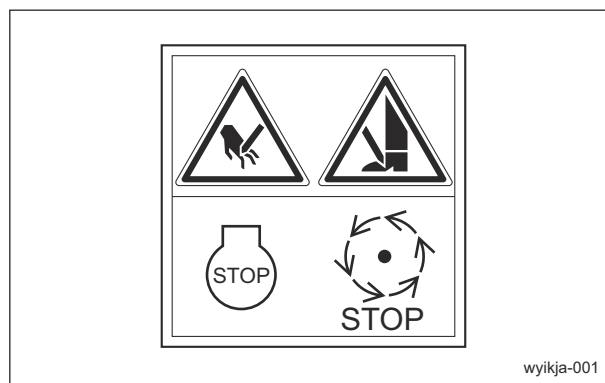
Description of Safety Decals and Instruction Decals

Caution to Mutilation Decal

K4205001600
DECAL, CAUTION TO MUTILATION

Warning

May cut your hand or leg - Stop the cutter rotation and engine. Otherwise you may get injured.



Caution to Mutilation Decal_001

Description of Functions

Traveling Rollers Page 4-2

Description of Functions

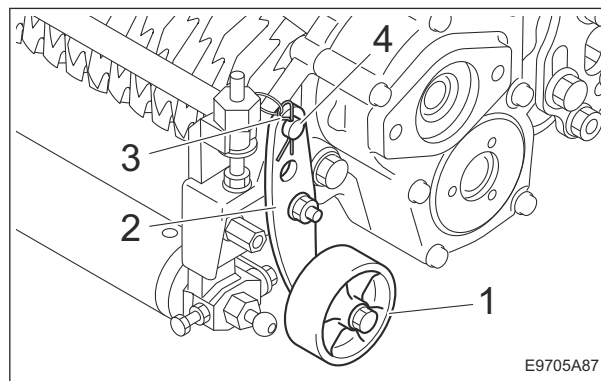
Description of Functions

Traveling Rollers

Important

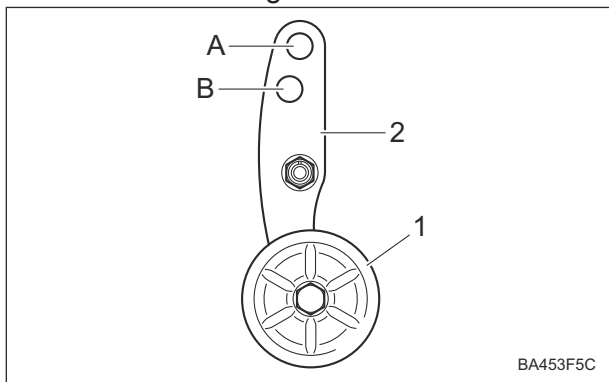
Lowering the thatching reel unit in an area other than lawn will damage the thatching blades.

By lowering the traveling rollers on the left and right sides of the thatching reel unit to raise the front rollers, contact between the thatching blades and the ground can be avoided. When dethatching work, raise the traveling rollers with the thatching reel unit attached to the main vehicle. Use the hole of the roller bracket to set the position of the traveling roller.



Traveling Rollers_002

1	Traveling roller
2	Roller bracket
3	Snap pin
4	Flat head pin



Traveling Rollers_001

1	Traveling roller
2	Roller bracket
A	For travel
B	For work

Follow the steps below to set the position of the traveling rollers.

1. Remove the snap pin.
2. Remove the flat head pin.
3. Raise and lower the roller to align your desired hole in the roller bracket with the hole in the frame.
4. Insert the flat head pin into the hole.
5. Install the snap pin.

Handling Instructions

Handling Precautions Page 5-2

Installation Page 5-2

 Procedure to Install Thatching Reel
 Unit Page 5-2

 Procedure to Remove Thatching
 Reel Unit Page 5-3

Inspection Before Use Page 5-4

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 Traveling Procedure Page 5-6

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Cleaning After Use Page 5-7

 Thatching Reel Unit Page 5-7

Storage Page 5-7

 Short-Term Storage Page 5-7

Handling Instructions

Handling Precautions

Important

This manual contains descriptions for handling the mower unit.

For details on handling the main vehicle, refer to this manual and the Owner's Operating Manual for the main vehicle.

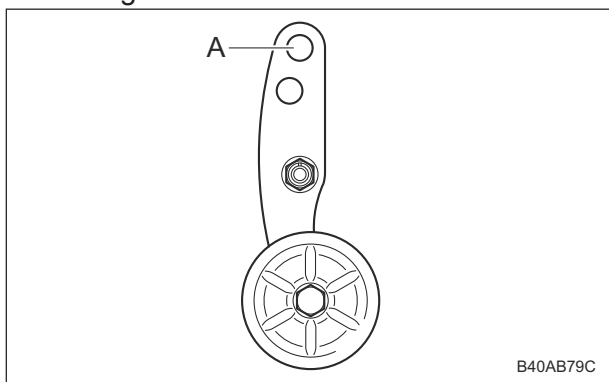
Installation

Procedure to Install Thatching Reel Unit

Important

Lowering the thatching reel unit in an area other than lawn may damage the thatching blades.

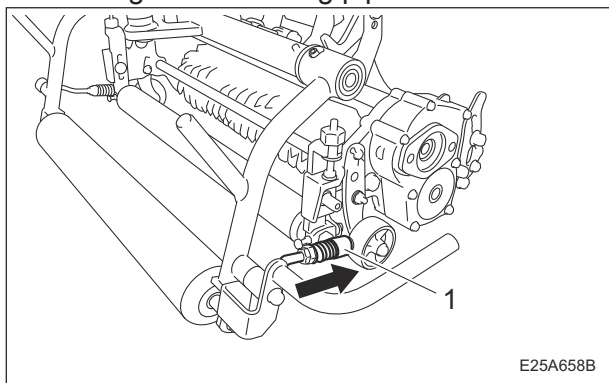
1. Make sure that the hole position of the traveling roller is set to "For travel".



Procedure to Install Thatching Reel Unit_001

A	For travel
---	------------

2. Place the thatching reel unit.
3. Install the stoppers of the left and right thatching reel unit fixing pipes into the frame.



Procedure to Install Thatching Reel Unit_002

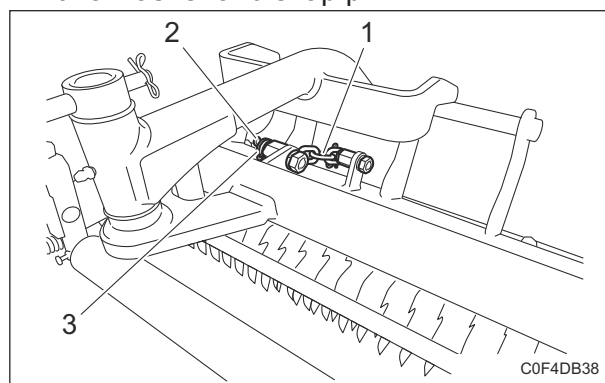
1	Stopper (left/right)
---	----------------------

Important

When installing the thatching reel unit #1, install the chain on the upper side of the hydraulic hose.

Otherwise, it will interfere with the hydraulic hose when the chain is stretched, and the hydraulic hose will be damaged.

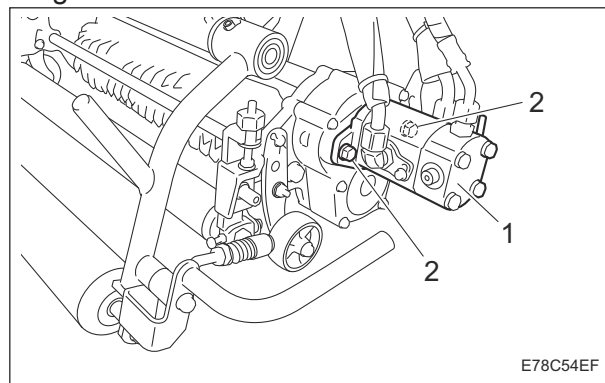
4. Install the chain into the thatching reel unit with a washer and snap pin.



Procedure to Install Thatching Reel Unit_003

1	Chain
2	Snap pin
3	Washer

5. Install the motor with bolts.
6. Tighten the bolts.



Procedure to Install Thatching Reel Unit_004

1	Motor
2	Bolt

Handling Instructions

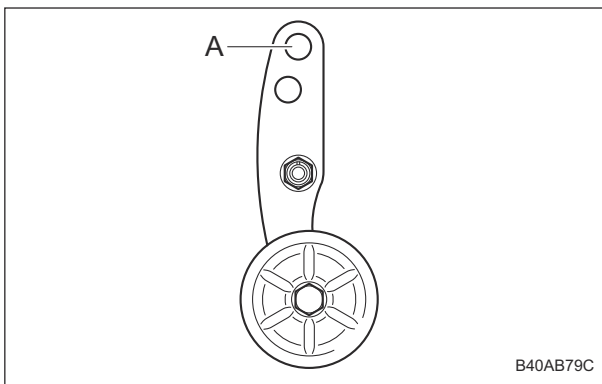
Procedure to Remove Thatching Reel Unit

1. Removing the thatching reel unit #1

Important

Lowering the thatching reel unit in an area other than lawn may damage the thatching blades.

- [1] Start the engine.
- [2] Raise all the thatching reel units.
- [3] Stop the engine.
- [4] Set the hole position of the traveling roller to "For travel".

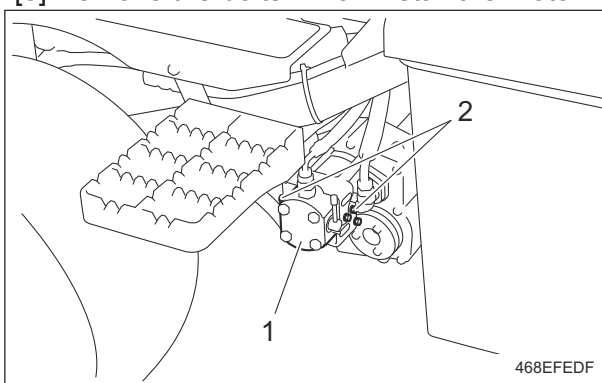


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Procedure to Remove Thatching Reel Unit_001

A	For travel
---	------------

- [5] Start the engine.
- [6] Lower all the thatching reel units.
- [7] Stop the engine.
- [8] Remove the bolts which install the motor.



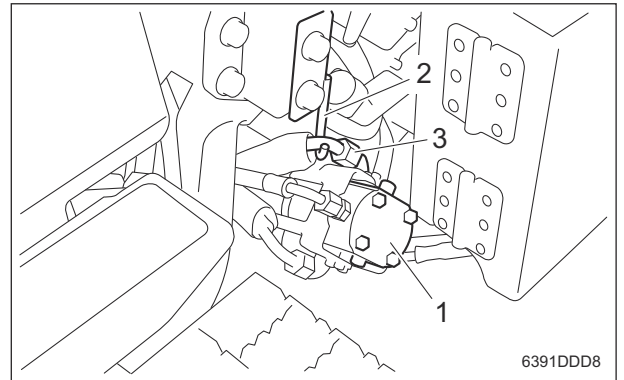
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Procedure to Remove Thatching Reel Unit_002

1	Motor
2	Bolt

- [9] Remove the motor.

- [10] Hang the hydraulic hose fitting of the removed motor on the hook.

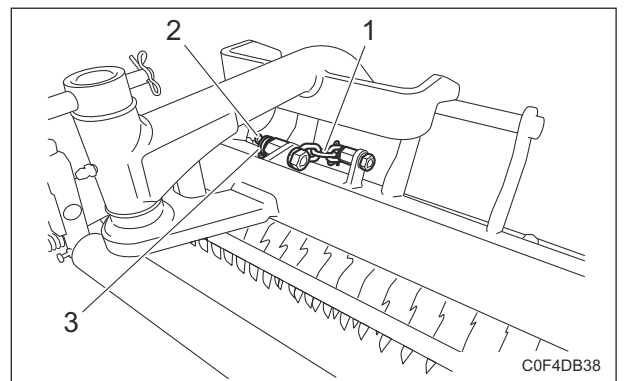


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Procedure to Remove Thatching Reel Unit_003

1	Motor
2	Hook
3	Hydraulic hose fitting

- [11] Remove the snap pin and washer which install the chain.
- [12] Remove the chain from the thatching reel unit.



C0F4DB38

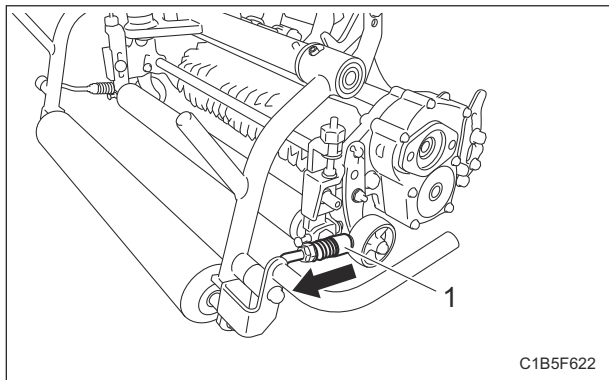
Procedure to Remove Thatching Reel Unit_004

1	Chain
2	Snap pin
3	Washer

- [13] Slide the stoppers of the left and right thatching reel unit fixing pipes forward and pull them up.

Handling Instructions

[14] Pull out the thatching reel unit and remove it.

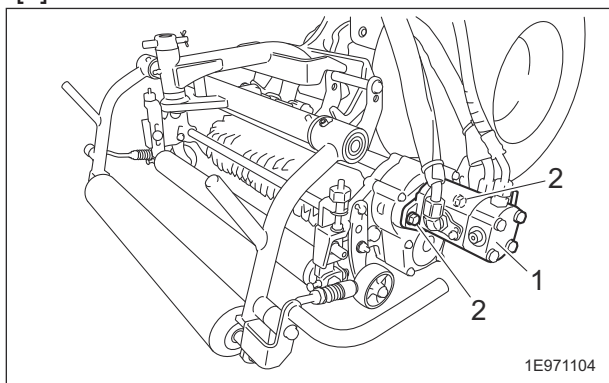


Procedure to Remove Thatching Reel Unit_005

1	Stopper (left/right)
---	----------------------

2. Removing the thatching reel unit #2 and #3

- [1] Start the engine.
- [2] Raise all the thatching reel units.
- [3] Stop the engine.
- [4] Set the hole position of the traveling roller to "For travel".
- [5] Start the engine.
- [6] Lower all the thatching reel units.
- [7] Stop the engine.
- [8] Remove the bolts which install the motor.



Procedure to Remove Thatching Reel Unit_006

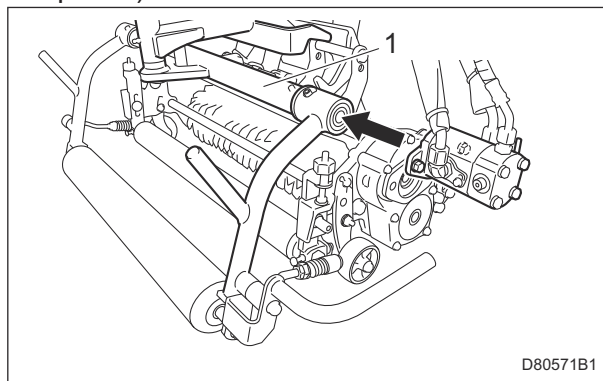
1	Motor
2	Bolt

[9] Remove the motor.

Important

The hole on the mower arm is for putting the motor during maintenance. Do not use it while traveling. Otherwise, the hydraulic system and the machine will be damaged.

[10] Insert the shaft of the removed motor into the hole (where the arrow in the diagram points) in the mower arm.



Procedure to Remove Thatching Reel Unit_007

1	Mower arm
---	-----------

- [11] Remove the snap pin and washer which install the chain.
- [12] Remove the chain from the thatching reel unit.
- [13] Slide the stoppers of the left and right thatching reel unit fixing pipes forward and pull them up.
- [14] Pull out the thatching reel unit and remove it.

Inspection Before Use

The purpose of the machine inspection is to:

- Prevent accidents
- Prevent damage to the machine
- Maintain machine performance

Detecting machine malfunctions early helps prevent unexpected problems from occurring. If you detect any abnormalities with the machine, immediately perform maintenance or repairs.

Thatching Reel Unit

Inspection of Thatching Blades

⚠ Caution

Wear gloves when touching edged tools to avoid cutting your hands.

- 1. Make sure that the edges of the thatching blades are not too blunt to cut.
- 2. Make sure that the thatching blades are not bent.
- 3. Make sure that the thatching blades are not chipped.

Handling Instructions

4. Check the amount of wear of the thatching blades.
5. Make sure that the blade shaft does not have distortion.

Inspection of Rollers

1. Make sure that there is no abrasion nor adhesion of the roller.
2. Make sure that there is no wear of the roller shaft.
3. Make sure that there is no wear nor damage of the oil seal.
4. Make sure that there is no wear nor rust of the bearing.
5. Make sure that there is no play in the roller shaft.

Inspection of Covers



Warning

If you have removed the covers during inspection, be sure to securely install them in their original positions.

If a cover remains removed, the operator may come into contact with rotating parts or belts and foreign objects may fly off, possibly resulting in injuries.

1. Make sure that there is no wear or deterioration of the reel cover and all other covers.
2. Make sure that there is no damage to the reel cover and all other covers.
3. Make sure that there is no interference with moving parts due to deformation of the reel cover and all other covers.
4. Make sure that the reel cover and all other covers are installed in their appropriate positions.

Inspection of Scraper

■ Inspection of Front Scraper

1. Make sure that there is no damage nor deformation of the scraper.
2. Make sure that there is no contact between the scraper and roller.

■ Inspection of Rear Scraper (Rod Type)

1. Make sure that there is no damage nor deformation of the scraper.

2. Make sure that there is no adhesion to the scraper mount.

Inspection of Bolts and Nuts

Important

The bolts and nuts may be loosened at the earlier stage of the use.

Be sure to retighten or replace before operating the machine whenever there is any abnormality.

1. Check the bolts and nuts for looseness and coming off.
2. Check the bolts and nuts for cracks and damages.
3. Check the bolts and nuts for rust.
4. Check around the bolts and nuts for traces of rust fluid.
5. Check for unequal bolt length.
6. Check the bolts and nuts for stripped threads and abrasion.

Handling Instructions

Move

Traveling Procedure

Warning

Set the reel rotation switch to the "Stop" position except when dethatching work.

Warning

In the case of 2WD/3WD model, travel in 2WD mode since it is dangerous to travel on steep downward slopes, wet road surface or downward slopes of wet lawn in 3WD mode. Rear tire going into a skid may cause loss of traveling control.

Caution

Under any circumstances drive the machine at such a speed that you can stop it immediately for emergencies.

Important

Do NOT start to move or stop the machine abruptly. It will damage the hydraulic system or result in oil leakage.

Important

Do not travel backward with the thatching reel unit lowered. Otherwise, the thatching reel unit comes off the lift fork when it is raised.

1. Start the engine.
2. Gradually move the throttle lever to the "High speed" position.
3. Raise all the thatching reel units.
4. Release the parking brake.
5. Slowly depress the traveling pedal.
6. The machine starts traveling.
7. The machine stops slowly when the traveling pedal released.

Operations

Dethatching Procedure

Warning

In the case of 2WD/3WD model, travel in 2WD mode since it is dangerous to travel on steep downward slopes, wet road surface or downward slopes of wet lawn in 3WD mode. Rear tire going into a skid may cause loss of traveling control.

Caution

Dethatching work must be performed at an appropriate speed for the site and location. When dethatching over bumpy surfaces, keep the engine rpm steady, and slow down the traveling speed.

Caution

Be sure to install the grass catchers. Otherwise, thrown objects from the thatching reel units may hit your feet.

Important

Do NOT start to move or stop the machine abruptly. It will damage the hydraulic system or result in oil leakage.

Important

Before dethatching work, be sure to set the hole position of the traveling rollers to "For work" with the thatching reel unit attached to the main vehicle.

1. Install the grass catchers.
2. Shift all the reel rotation/stop switching lever to "Rotation" position.
Note:
When the thatching reel unit is installed, the reel rotation/stop switching lever means the thatching reel rotation/stop switching lever.
3. Start the engine.
4. Raise all the thatching units.
5. Stop the engine.
6. Set the hole position of the traveling rollers to "For work".

Handling Instructions

7. Start the engine.
8. Shift the throttle lever to the "High speed" position to run the engine at the maximum speed.
9. Release the parking brake.
10. Set the reel rotation switch to the "Rotation" position.
Note:
When the thatching reel unit is installed, the reel rotation switch means the thatching reel rotation switch.
11. Start the work following the procedure below.
 - [1] Depress the traveling pedal.
 - [2] Lower the thatching reel units at the working position.
 - [3] Raise all the thatching reel units after work is completed.
Note:
During dethatching work, thatching reels rotate or stop in sync with the up and down motion of the thatching reel units.
 - [4] Set the reel rotation switch to the "Stop" position after dethatching work is completed.

Cleaning After Use

The purpose of the machine cleaning is to:

- Prevent accidents
- Prevent damage to the machine
- Maintain machine performance

Properly clean the machine to maintain its functionality and performance.

If you detect any abnormalities with the machine, immediately perform maintenance or repairs.

Thatching Reel Unit

Cleaning of Thatching Reel Unit

Important

While cleaning, do not allow water on the sealed parts of the thatching reel shaft. (Avoid high-pressure water cleaning.) Otherwise, it may cause damage to the machine.

Be sure to clean the thatching reel unit after use.

1. Stop the engine.

2. Carefully clean the front and back of the thatching reel unit with water or compressed air.
3. Remove any grass wrapped around the thatching reel.

Storage

Short-Term Storage

Short-term storage means that the machine is temporarily stored (within 1 month) without use.

Follow the instructions below for short-term storage of this thatching reel unit.

1. Cleaning
 - Remove dirt, grass clippings, oil stains etc. completely.
2. Thatching reel unit
 - Lower the traveling rollers to prevent thatching blades from touching the ground.
3. Storage location
 - Cover the thatching reel unit and store it in a dry place where it will not be exposed to rain.

Handling Instructions

Precautions for MaintenancePage 6-2

Greasing Page 6-2

About GreasingPage 6-2

Greasing Points Page 6-2

Adjustment Page 6-3

Thatching Reel Unit Page 6-3

Replace Page 6-5

Thatching Reel Unit Page 6-5

Storage Page 6-12

Long-Term Storage Page 6-12

Precautions for Maintenance

Warning

The chapter "Maintenance" in this manual describes practical measures which should be performed by a mechanic with expertise. The owner should instruct the mechanic with expertise to perform maintenance service for this machine.

Caution

First, learn well the operations you plan to perform.

Important

Use tools appropriate for each operation.

Important

Use Baronesse genuine parts for replacement and accessories. Our product warranty may be void if you use non-genuine parts for replacement or accessories.

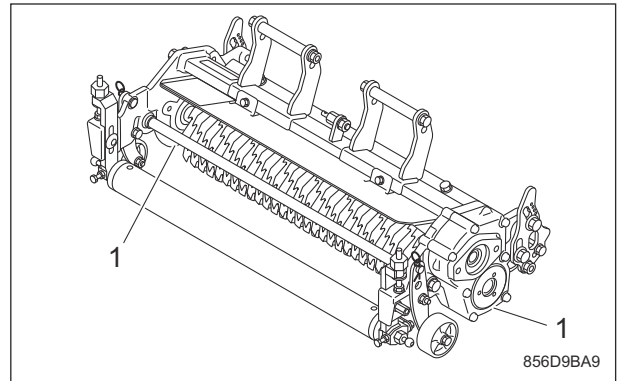
Greasing

About Greasing

Since there may be adhesion or damage due to lack of grease on moving parts, they must be greased. Add urea-based No. 2 grease in accordance with the Maintenance Schedule. Other locations where the specified grease or lubricant is used are indicated in "Greasing Points". Add grease using the specified grease or lubricant.

Greasing Points

Grease nipples are installed in the following locations. Add grease every 50 hours of operation. However, for locations where the time is specified, add grease according to that schedule.



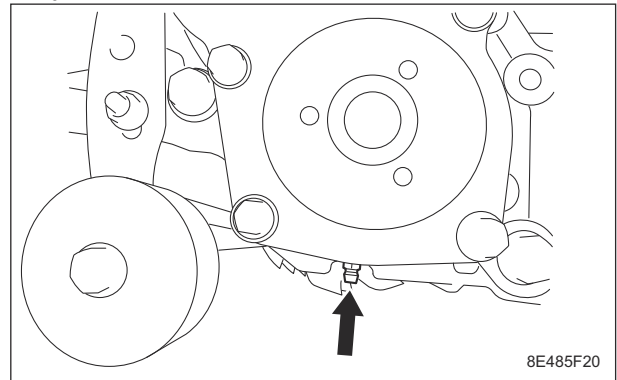
Greasing Points_001

	Location	No. of greasing points
1	Housing	2

1. Housing

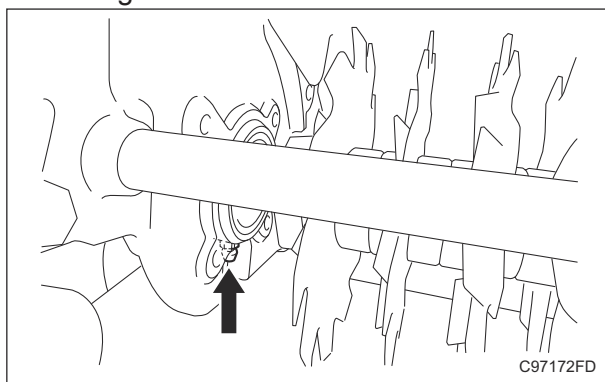
There is one point each on the left and right housings.

Hydraulic motor side



Greasing Points_002

Housing side



Greasing Points_003

Adjustment

Thatching Reel Unit

Adjustment of Dethatching Depth

Caution

Thatching blades are edged tools. Handle them carefully, since they could cut your hands or legs.

Important

The recommended maximum dethatching depth is 0 - 2 mm (0 - 0.79 in) for greens and 0 - 3 mm (0 - 0.12 in) for fields. The setting deeper than the recommended maximum dethatching depth will cause damage to the blades and the machine. However, the recommended maximum dethatching depth may differ depending on the conditions of the fields.

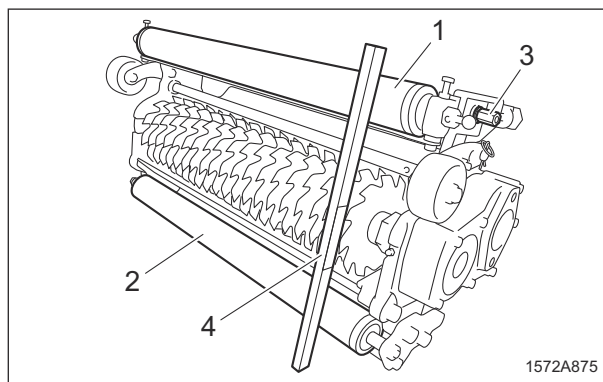
Important

The dethatching depth values show rough indications. They may not be the same as the actual depth.

The dethatching depth can be adjusted by changing the height of front roller.

1. Stand the thatching reel unit with the front roller facing upward.
2. Loosen the left and right nuts.

3. Bring the depth gauge (accessory) into contact with the front roller and rear roller at the left or right end of the thatching reel unit.

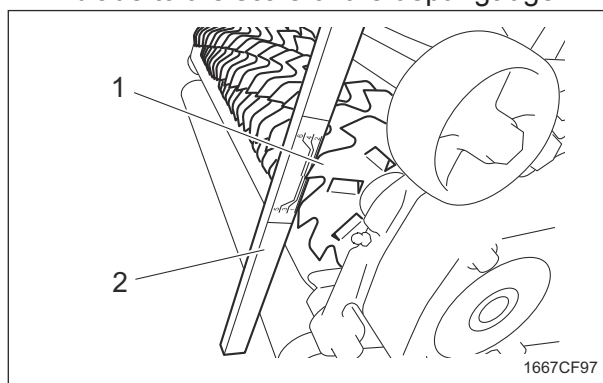


Adjustment of Dethatching Depth_001

1	Front roller
2	Rear roller
3	Nut
4	Depth gauge

4. Adjust the cutting depth to the desired position by using the scale of the depth gauge.

- [1] Determine the cutting depth by applying the vertex of the arc of the thatching blade to the scale of the depth gauge.



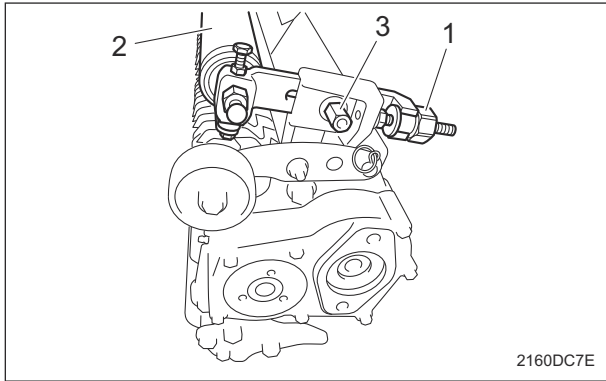
Adjustment of Dethatching Depth_002

1	Thatching blade
2	Depth gauge

- [2] Move the front roller up and down with the roller adjuster.
- To decrease the dethatching depth: Tighten the roller adjuster to lower the position of the front roller.
 - To increase the dethatching depth: Loosen the roller adjuster to raise the position of the front roller.

Maintenance

[3] Firmly tighten the roller adjuster.



Adjustment of Dethatching Depth_003

1	Roller adjuster
2	Front roller
3	Nut

- Repeat the same procedure at the end of the opposite side of the thatching reel unit (left or right end) for the adjustment of dethatching depth.
- Bring the gauge into contact with the front roller and rear roller at the left and right ends of the thatching reel unit again to check the dethatching depth is at the required position.
- Firmly tighten the left and right nuts.

Adjustment of Scraper

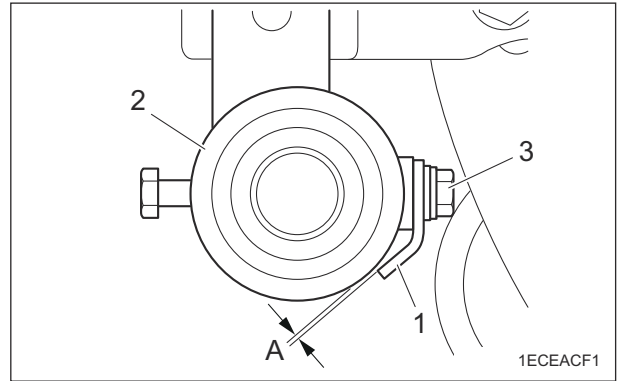
■ Adjustment of Front Scraper

Important

Do not place the scraper in contact with the front roller too tightly. It will cause deformation of the scraper and damage to the front roller.

- Loosen the left and right bolts of the scraper.

- Adjust the clearance between the scraper and the outer diameter surface of the front roller to 1.0 to 2.0 mm (0.039 to 0.079 in), and then firmly tighten the loosened bolts.



Adjustment of Front Scraper_001

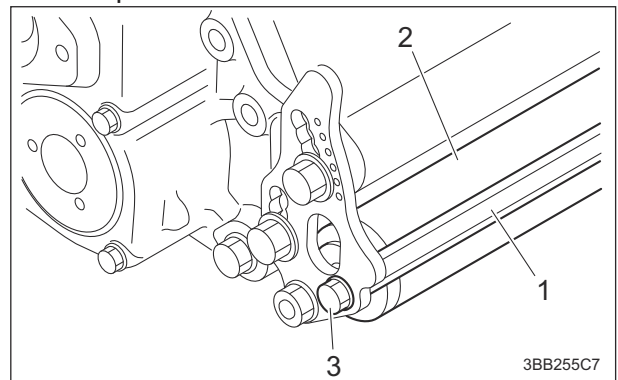
1	Scraper
2	Front roller
3	Bolt
A	1.0 to 2.0 mm (0.039 to 0.079 in)

■ Adjustment of Rear Scraper (Rod Type)

Important

Do not place the scraper in contact with the rear roller too tightly. It will cause deformation of the scraper and damage to the rear roller.

- Loosen the left and right bolts of the scraper.



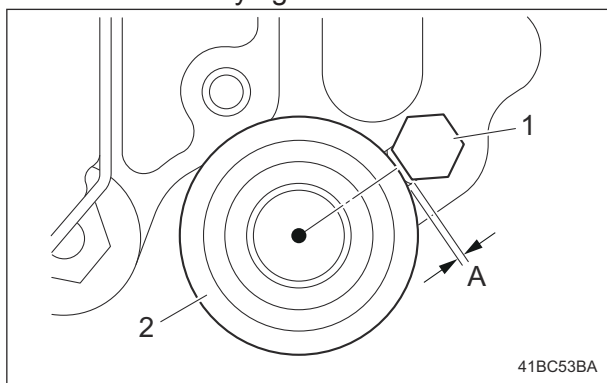
Adjustment of Rear Scraper (Rod Type)_001

1	Scraper
2	Rear roller
3	Bolt

Important

Adjust the surface of the hexagonal bar of the scraper to make it vertical to the center of the cylinder of the rear roller. Otherwise, it will cause deformation of the scraper and damage to the rear roller.

- Adjust the clearance between the scraper and the outer diameter surface of the front roller to 1.0 to 2.0 mm (0.039 to 0.079 in), and then firmly tighten the loosened bolts.



Adjustment of Rear Scraper (Rod Type)_002

1	Scraper
2	Rear roller
A	1.0 to 2.0 mm (0.039 to 0.079 in)

Replace

Thatching Reel Unit

Replacement of Thatching Blades

Warning

Be sure to stop the engine before change of the thatching blades.

Caution

The thatching blades are edged tools. Take extra care in handling since they could cut your hands or legs.

Caution

When touching edged tools, be sure to wear gloves since they could cut your hands.

Important

Replace all thatching blades.

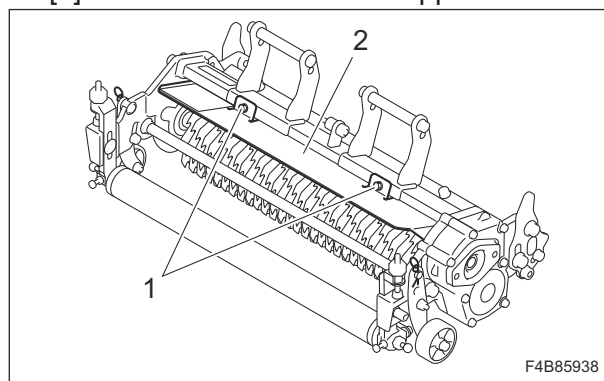
Removal of Thatching Blades

Caution

If your hands or fingers come into contact with the thatching blades, you may be injured. Be sure to wear gloves when handling and be careful not to get injured.

- Follow the steps below to remove the lower cover.

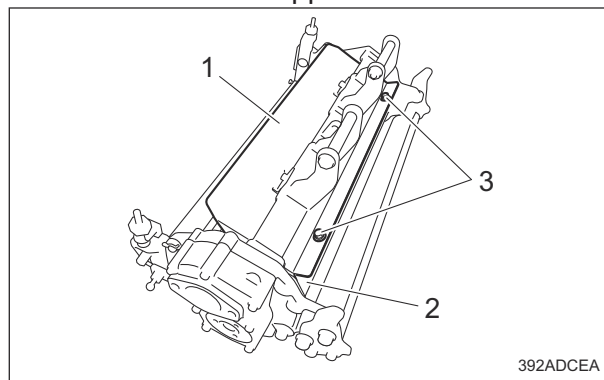
[1] Loosen the bolts on the upper cover.



Removal of Thatching Blades_001

1	Bolt
2	Upper cover

- Remove the bolts connecting the lower cover and the upper cover.



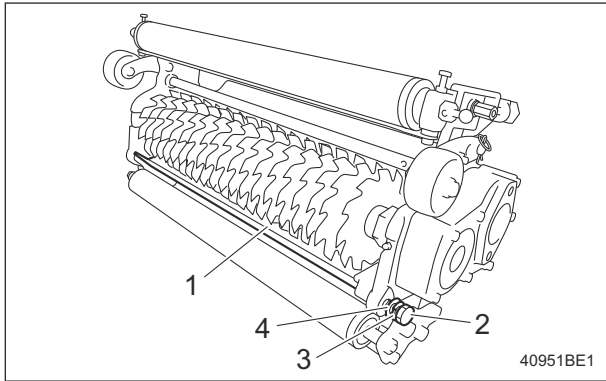
Removal of Thatching Blades_002

1	Upper cover
2	Lower cover
3	Bolt

- Stand the thatching reel unit with the front roller facing upward.
- Remove the left and right bolts installing the lower cover.

Maintenance

[5] Remove the lower cover.



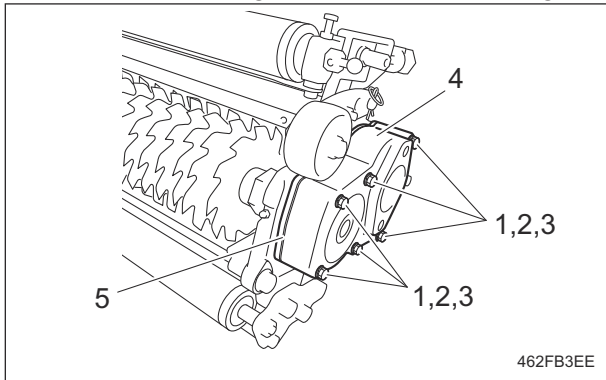
Removal of Thatching Blades_003

1	Lower cover
2	Bolt
3	Spring washer
4	Washer

2. Follow the steps below to remove the thatching blade Assy.

[1] Remove the bolts installing the gear cover.

[2] Remove the gear cover and packing.

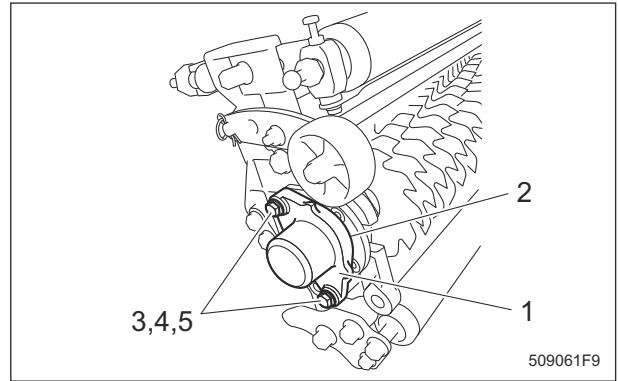


Removal of Thatching Blades_004

1	Bolt
2	Spring washer
3	Washer
4	Gear cover
5	Packing

[3] Remove the bolts installing the shaft cover.

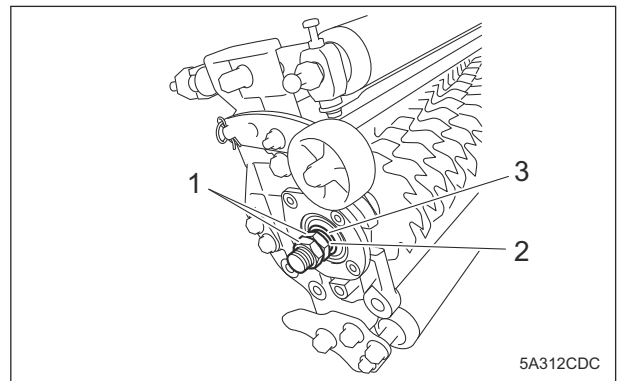
[4] Remove the shaft cover and O ring.



Removal of Thatching Blades_005

1	Shaft cover
2	O ring
3	Bolt
4	Spring washer
5	Washer

[5] Remove the nuts, collar and wave washer.



Removal of Thatching Blades_006

1	Nut
2	Collar
3	Wave washer

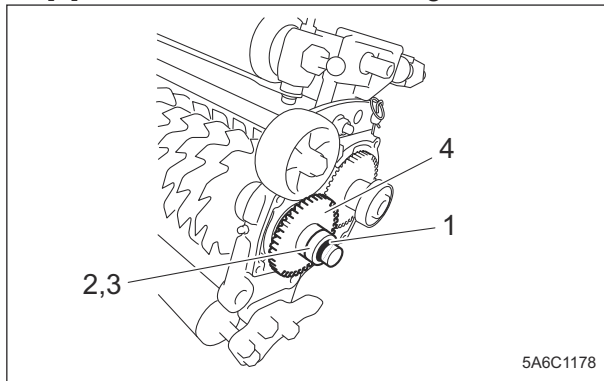
⚠ Caution

When removing the reel 40-teeth gear, the thatching blade Assy rotates. Take extra care in handling thatching blades since they could cut your hands or legs.

[6] Remove the O ring and the pin lock cover.

[7] Pull out the straight pin.

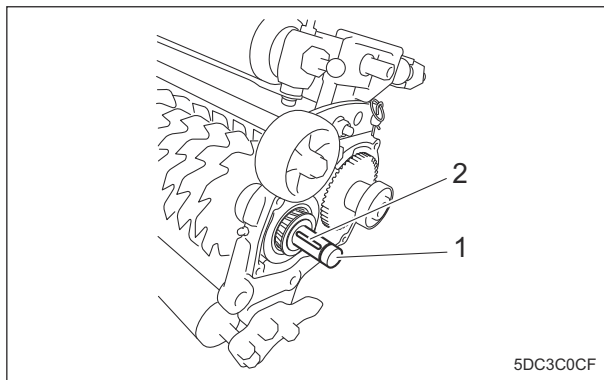
[8] Remove the reel 40-teeth gear.



Removal of Thatching Blades_007

1	O ring
2	Pin lock cover
3	Straight pin
4	Reel 40-teeth gear

[9] Remove the key from the thatching reel shaft.

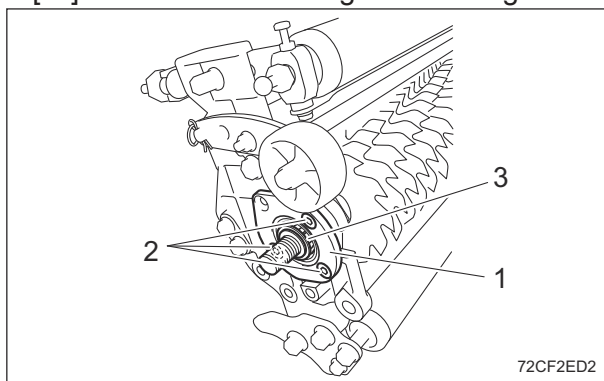


Removal of Thatching Blades_008

1	Thatching reel shaft
2	Key

[10] Remove the countersunk bolts with hexagon hole installing the housing.

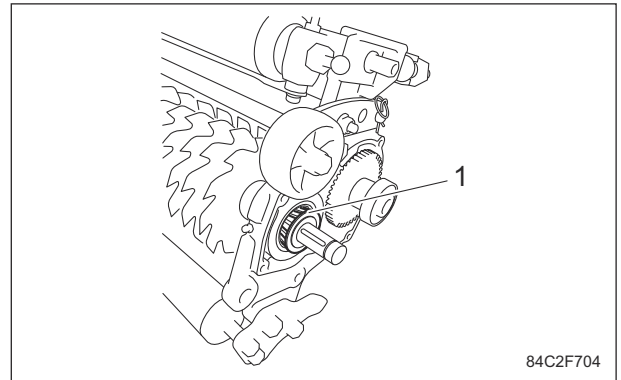
[11] Remove the housing and bearing.



Removal of Thatching Blades_009

1	Housing
2	Countersunk bolt with hexagon hole
3	Bearing

[12] Remove the bearing on the keyway side.

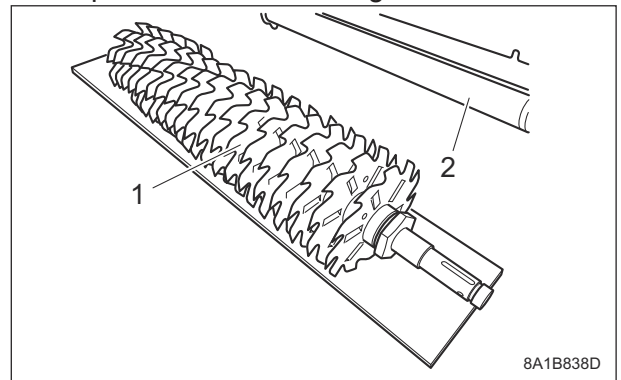


Removal of Thatching Blades_010

1	Bearing
---	---------

[13] Remove the thatching blade Assy from the frame.

[14] Place the thatching blade Assy on a wooden board or other material to prevent it from rotating.



Removal of Thatching Blades_011

1	Thatching blade Assy
2	Frame

3. Disassemble the thatching blade Assy.

[1] Remove the special nut.

[2] Remove the disc spring washer.

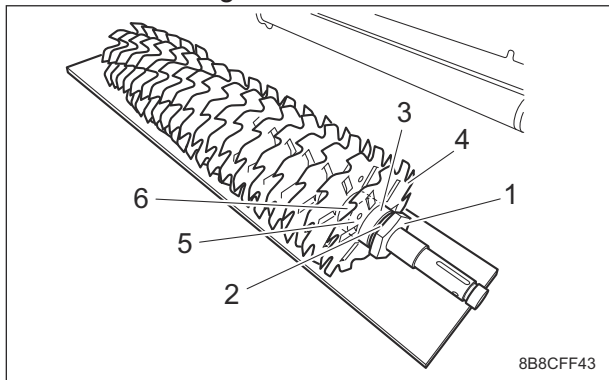
[3] Remove the end collar.

[4] Remove the thatching blades and collars.

- For greens: Remove in order of a thatching blade, collar A.

Maintenance

- For fields: Remove in order of a thatching blade, collar A and collar B.



Removal of Thatching Blades_012

1	Special nut
2	Disc spring washer
3	End collar
4	Thatching blade
5	Collar A
6	Collar B

■ Installation of Thatching Blades

⚠ Caution

If your hands or fingers come into contact with the thatching blades, you may be injured. Be sure to wear gloves when handling and be careful not to get injured.

1. Assemble the thatching blade Assy.

[1] Stand up the blade shaft with the keyway side of the thatching reel shaft facing upward.

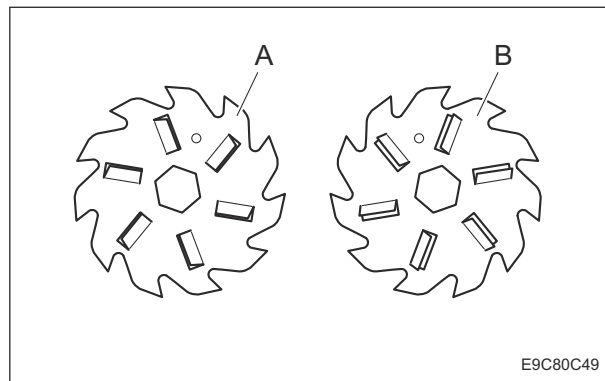
[2] Install the end collar.

[3] Install in order of a thatching blade, collar.

- For greens: Install in order of a thatching blade, collar A.
- For fields: Install in order of a thatching blade, collar B and collar A.

Important

Thatching blade with tips has a front and back. Be careful to install it correctly.

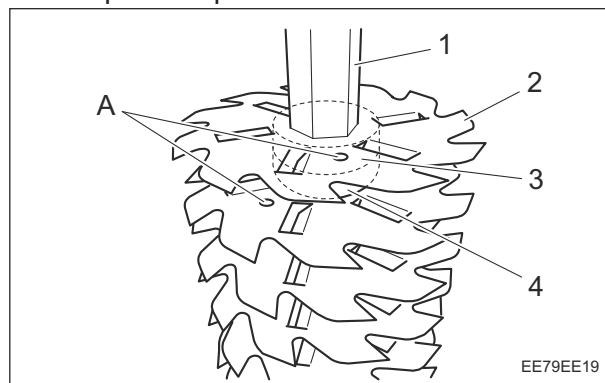


Installation of Thatching Blades_001

A	Front side
B	Back side

[4] Rotate the blade shaft clockwise by one of its six sides, and install in order of a thatching blade (with the front side upward), collar.

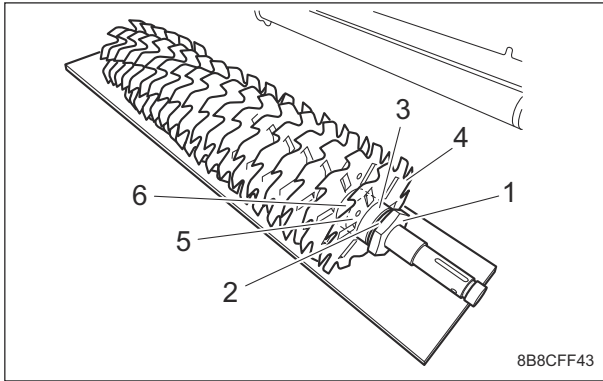
- For greens: Install in order of a thatching blade, collar A.
- For fields: Install in order of a thatching blade, collar B and collar A. Each time inserting one thatching blade into the blade shaft, rotate the blade shaft clockwise by one of its six sides. Using the position of the hole in the blade as a guide, shift the position of the hole by 60 degrees to arrange the blade tips in a spiral.



Installation of Thatching Blades_002

1	Blade shaft
2	Thatching blade
3	Collar A
4	Collar B
A	Hole

- [5] Install the end collar.
- [6] Install the disc spring washer.
- [7] Install the special nut.



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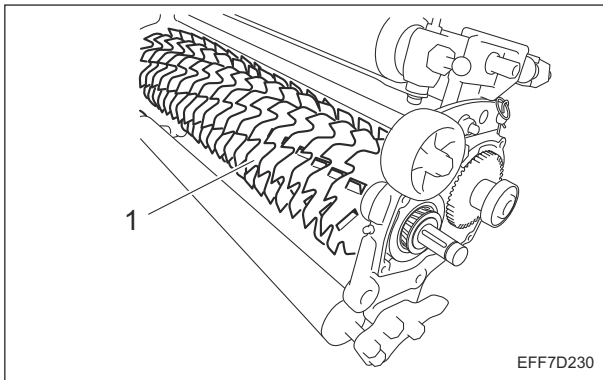
Installation of Thatching Blades_003

1	Special nut
2	Disc spring washer
3	End collar
4	Thatching blade
5	Collar A
6	Collar B

Important

Install the thatching blade Assy to the frame with keyway side to the right side (when you face the frame from the front).

- 2. Stand the frame with the front roller facing upward.
- 3. Install the thatching blade Assy into the frame.



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Installation of Thatching Blades_004

1	Thatching blade Assy
---	----------------------

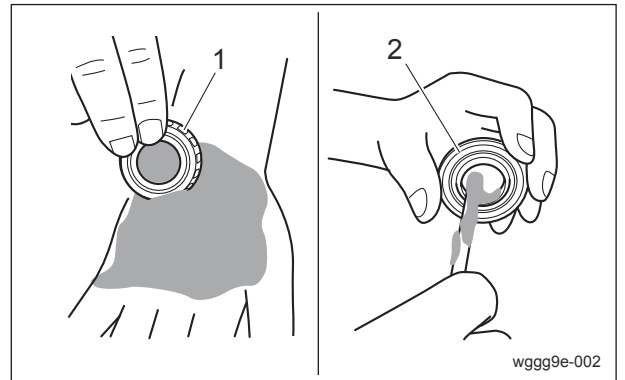
Important

Make sure that the length of the left and right protrusions of the shaft of the thatching blade Assy are equal.

Important

Be sure to replace the oil seal and bearing with new ones.

- 4. Apply sufficient grease to the new bearing and oil seal.
For bearing, apply grease as rubbing in until it comes out from the other side.
For oil seal, apply sufficient grease to the lip surface.

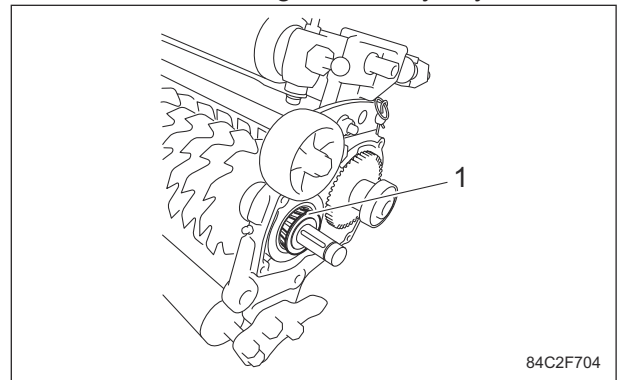


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Installation of Thatching Blades_005

1	Bearing
2	Oil seal

- 5. Install the bearing on the keyway side.



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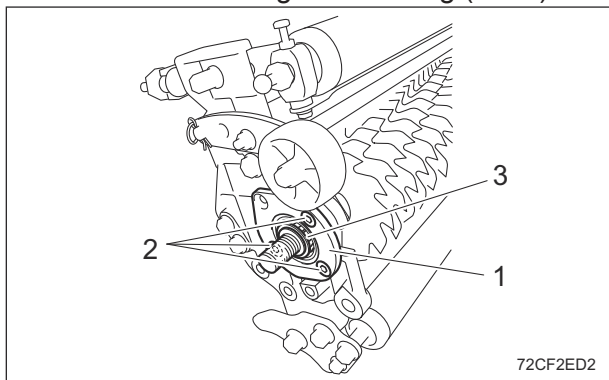
Installation of Thatching Blades_006

1	Bearing
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- 6. Drive the oil seal and bearing (outer) into the housing.

Maintenance

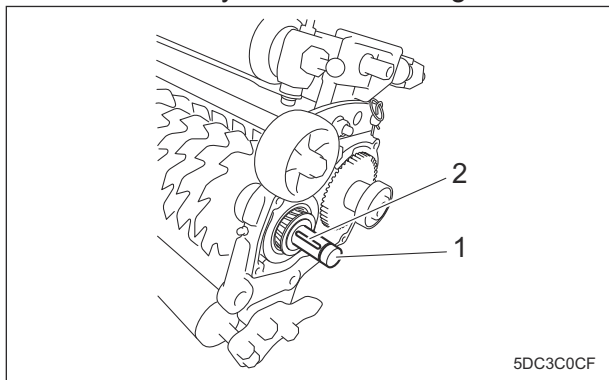
7. Install the housing and bearing (inner).



Installation of Thatching Blades_007

1	Housing
2	Countersunk bolt with hexagon hole
3	Bearing

8. Install the key into the thatching reel shaft.



Installation of Thatching Blades_008

1	Thatching reel shaft
2	Key

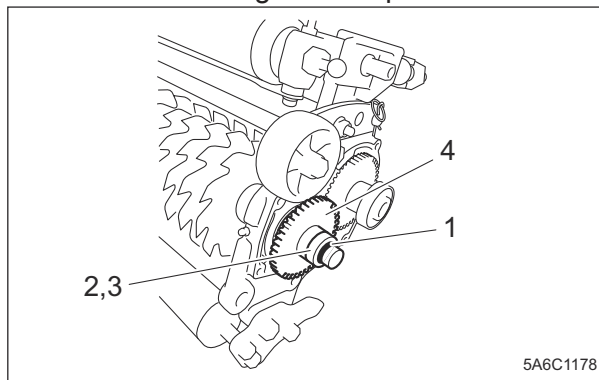
⚠ Caution

When installing the reel 40-teeth gear, the thatching blade Assy rotates. Take extra care in handling thatching blades since they could cut your hands or legs.

9. Install the reel 40-teeth gear.

10. Insert the straight pin.

11. Install the O ring and the pin lock cover.



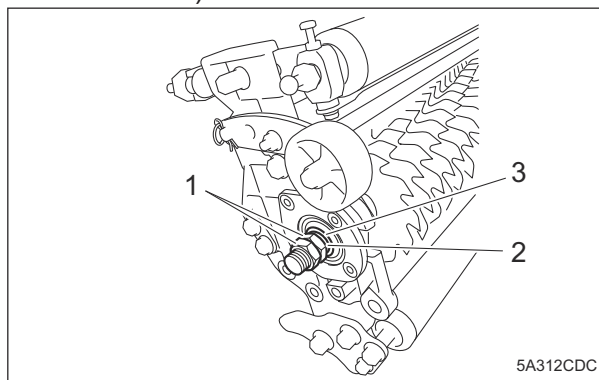
Installation of Thatching Blades_009

1	O ring
2	Pin lock cover
3	Straight pin
4	Reel 40-teeth gear

12. Install the wave washer and collar.

13. Install the nuts.

Tightening torque: 2.5 N-m (25.49 kgf-cm/ 22.13 lb-in)

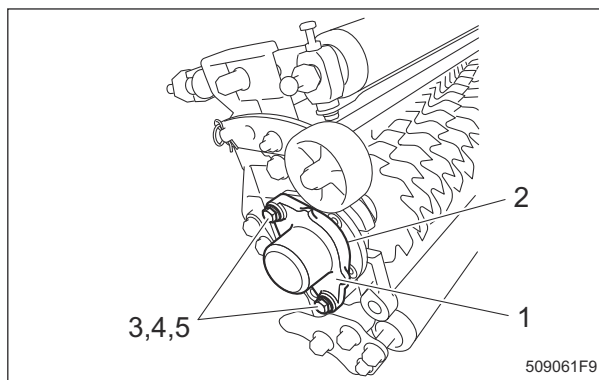


Installation of Thatching Blades_010

1	Nut
2	Collar
3	Wave washer

14. Install the O ring.

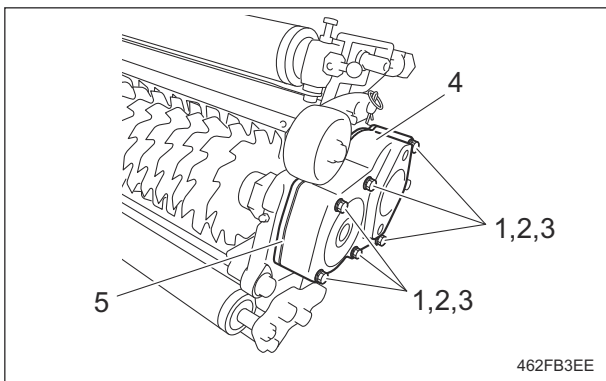
15. Install the shaft cover, and tighten the bolts.



Installation of Thatching Blades_011

1	Shaft cover
2	O ring
3	Bolt
4	Spring washer
5	Washer

- 16. Install the packing.
- 17. Install the gear cover, and tighten the bolts.

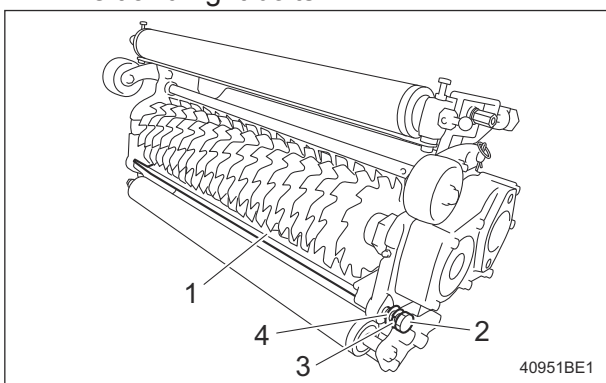


Installation of Thatching Blades_012

1	Bolt
2	Spring washer
3	Washer
4	Gear cover
5	Packing

- 18. Follow the steps below to install the lower cover.

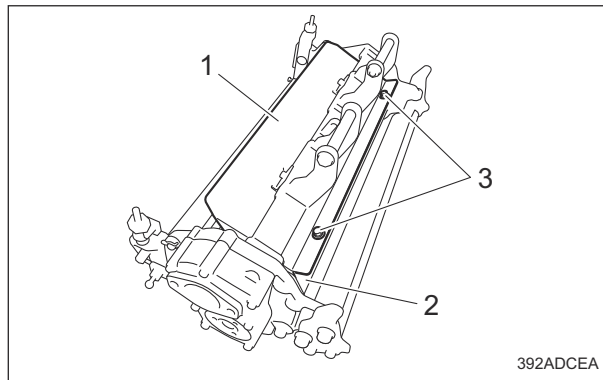
- [1] Install the lower cover, and tighten the left and right bolts.



Installation of Thatching Blades_013

1	Lower cover
2	Bolt
3	Spring washer
4	Washer

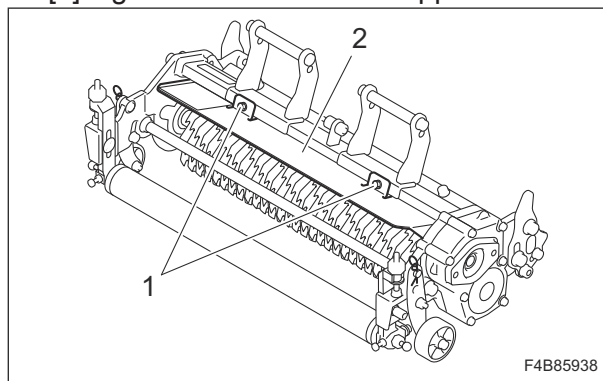
- [2] Connect the lower cover and upper cover with bolts.



Installation of Thatching Blades_014

1	Upper cover
2	Lower cover
3	Bolt

- [3] Tighten the bolts on the upper cover.



Installation of Thatching Blades_015

1	Bolt
2	Upper cover

Maintenance

Storage

Long-Term Storage

Follow the instructions below for long-term storage of this thatching reel unit.

1. Cleaning

- Remove dirt, grass clippings, oil stains etc. completely.

2. Lubrication

- Grease and lubricate the appropriate points.

3. Thatching reel unit

- Lower the traveling rollers to prevent thatching blades from touching the ground.

4. Storage location

- Cover the thatching reel unit and store it in a dry place where it will not be exposed to rain.

Appended Table

Tightening TorquesPage 7-2
 Standard Tightening TorquesPage 7-2

Daily Check List Page 7-4

Maintenance Schedule Page 7-4

Appended Table

Appended Table

Tightening Torques

Important

Refer to the Tightening Torque table.
Note that the Baroness product warranty may not apply to defects caused by incorrect or overtorque tightening, etc.

Standard Tightening Torques


Bolts and Nuts

Important



A number of bolts are used in each part of this machine.
Be sure to re-tighten the bolts and nuts, because they may be loosened at the earlier stage of the use.

- As to the bolts and nuts without any special instruction, tighten them in appropriate tightening torque with proper tool.
Too much tightening may cause the looseness or damage of the screw.
- The strength of tightening is determined by types of screws, strength, the friction of thread face or base face and others.
The table below is for the galvanized or parkerized bolts.
In case that the strength of internal thread is weak, it is not applied.
- Do not use rusty or sand attached "screw."
Otherwise, it may cause insufficient tightening even if you apply the specified tightening torque.
The friction of the screw face becomes higher and the tightening torque is canceled out by the friction, therefore sufficient tightening cannot be applied.
- If "screw" is wet by water or oil, do not tighten it with normal tightening torque.
If the screw is wet, the torque coefficient will get smaller and it may result in too much tightening.
Too much tightening may cause looseness by the screw stretched or result in damage.
- Do not use a bolt experienced too much burden.
- Using the impact wrench requires the skill.
Do exercise as much as possible for steady tightening.

Appended Table

Nominal diameter	General bolt		
	Strength classification 4.8		
	 tib3yb-001		
	N-m	kgf-cm	lb-in
M5	3 - 5	30.59 - 50.99	26.55 - 44.26
M6	7 - 9	71.38 - 91.77	61.96 - 79.66
M8	14 - 19	142.76 - 193.74	123.91 - 168.17
M10	29 - 38	295.71 - 387.49	256.68 - 336.34
M12	52 - 67	530.24 - 683.20	460.25 - 593.02
M14	70 - 94	713.79 - 958.52	619.57 - 831.99
M16	88 - 112	897.34 - 1142.06	778.89 - 991.31
M18	116 - 144	1,182.85 - 1,468.37	1,026.72 - 1,274.54
M20	147 - 183	1,498.96 - 1,866.05	1,301.10 - 1,619.73
M22	295	3,008.12	2,611.05
M24	370	3,772.89	3,274.87
M27	550	5,608.35	4,868.05
M30	740	7,545.78	6,549.74

Appended Table

Nominal diameter	Heat-treated bolt					
	Strength classification 8.8			Strength classification 10.9		
	 tib3yb-002			 tib3yb-003		
	N-m	kgf-cm	lb-in	N-m	kgf-cm	lb-in
M5	5 - 7	50.99 - 71.38	44.26 - 61.96	7 - 10	71.38 - 101.97	61.96 - 88.51
M6	8 - 11	81.58 - 112.17	70.81 - 97.36	14 - 18	142.76 - 183.55	123.91 - 159.32
M8	23 - 29	234.53 - 295.71	203.57 - 256.68	28 - 38	285.52 - 387.49	247.83 - 336.34
M10	45 - 57	458.87 - 581.23	398.30 - 504.51	58 - 76	591.43 - 774.97	513.36 - 672.68
M12	67 - 85	683.20 - 866.75	593.02 - 752.34	104 - 134	1,060.49 - 1,366.40	920.50 - 1186.03
M14	106 - 134	1,080.88 - 1,366.40	938.21 - 1,186.03	140 - 188	1,427.58 - 1,917.04	1,239.14 - 1,663.99
M16	152 - 188	1,549.94 - 1,917.04	1,345.35 - 1,663.99	210 - 260	2,141.37 - 2,651.22	1,858.71 - 2,301.26
M18	200 - 240	2,039.40 - 2,447.28	1,770.20 - 2,124.24	280 - 340	2,855.16 - 3,466.98	2,478.28 - 3,009.34
M20	245 - 295	2,498.27 - 3,008.12	2,168.50 - 2,611.05	370 - 450	3,772.89 - 4,588.65	3,274.87 - 3,982.95
M22	-	-	-	530	5,404.41	4,691.03
M24	-	-	-	670	6,831.99	5,930.17
M27	-	-	-	1,000	10,197.00	8,851.00
M30	-	-	-	1,340	13,663.98	11,860.34

Note:
The same values are applied to "fine screw thread."

Appended Table

Daily Check List

- . . . Inspect, adjust, supply, clean (first time)
- . . . Inspect, adjust, supply, clean
- ▲ . . . Replace (first time)
- △ . . . Replace

Maintenance Item		Before Work	After Work	Remarks
Mower unit	Check thatching blades	○		
	Check roller	○		
	Check cover	○		
	Check scraper	○		
	Check thatching reel unit exterior	○		
	Check bolts and nuts	○		
	Clean thatching reel unit		○	

Maintenance Schedule

ATR311

- . . . Inspect, adjust, supply, clean (first time)
- . . . Inspect, adjust, supply, clean
- ▲ . . . Replace (first time)
- △ . . . Replace

Maintenance Item		Before Work	Every 50 hrs.	When Required	Remarks
Mower unit	Check dethatching depth	○			
	Grease		○		
	Adjust dethatching depth			○	
	Adjust scraper			○	
	Replace thatching blade			△	

Daily Check Records Page 8-2

Maintenance RecordsPage 8-3

Records

Records

Daily Check Records

ATR311

Use this table freely for your records of the daily check.

Model		Serial Number	
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Items											
Mower unit	Check thatching blades										
	Check roller										
	Check cover										
	Check scraper										
	Check thatching reel unit exterior										
	Check bolts and nuts										
	Clean thatching reel unit										

Maintenance Records

ATR311
 Use this table freely for your records of the maintenance.

Model		Serial Number	
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Items											
Mower unit	Check dethatching depth										
	Grease										
	Adjust dethatching depth										
	Adjust scraper										
	Replace thatching blade										

Records

Records

BARONESS[®]
Quality on Demand

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